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BIRD DAMAGE RESEARCH AT THE UNIVERSITY OF CALIFORNIA, DAVIS

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ABSTRACT: The University of California, Davis, starling research program was broadened in 1976 to encompass agricultural pest birds in general. Under new direction there were a number of applied problems studied. The effects of feeding cattle only between 1600 hours and 0800 hours on cattle weight gain was studied with results indicating slower weight gains and lower meat quality when compared to cattle fed *ad lib*. Feed component selection by starlings (*Sturnus vulgaris*) was also studied finding that a starling selected diet contains a higher percentage of the high protein components than present in a commercially prepared dairy feed ration fed to them. References are given to papers on a damage assessment technique for grapes, a field test of methiocarb as an avian repellent to protect figs, and a field test using Avitrol treated seed to control house finches (*Carpodacus mexicanus*). An overview of continuing research activities and a status report on the bird damage specialist position is discussed.

The scope of the University of California, Davis, starling research program was broadened in 1976 to include agricultural pest birds in general. Under the supervision of the Bird Damage Task Force and later direct supervision from the College of Agricultural and Environmental Sciences Deans Office a number of applied research projects were conducted. This paper will report on several of these studies.

EFFECTS OF REDUCED FEEDING TIME ON FEEDLOT CATTLE

Losses to pest birds by cattle feedlot operators is a problem in the California beef cattle industry. During the winter large flocks of starlings turn to feedlots as a food source.

It was considered that by making the feed unavailable to the birds the feedlot operator would be able to reduce the amount of feed lost to the birds. The objective of the study was to see what effect that shortening the feeding period to 16 hours (from late afternoon until early morning) would have on cattle weight gain and meat quality. After this trial was initiated, it was learned that in some feedlots in France cattle were being fed beet pulp during the day and the high protein feedlot rations at night (Davis, personal Comm.).

Methods and Materials

Dr. William Garrett of the Department of Animal Science at U.C. Davis had already designed a study to test the effect of various feed rations on steers. We incorporated our 16 hour feeding regime into the experiment. The experiment was designed to measure the effect of the various rations tested and also the effect of shortening the feeding time to 16 hours. In all 72 steers were involved, 36 fed *ad lib* and 36 fed 16 hours, from 1600 hours until 0800 hours. Both groups were subdivided into six groups of six animals to test the effect of the six test rations. The rations varied in the percentage of protein and roughage. For the purpose of this study, we compared only the responses of all cattle fed 16 hours to the responses of all cattle fed *ad lib*. Weight gain and feed consumption were measured every 28 days for each animal. At the completion of the test parameters such as carcass density, quality grade, rib-eye area, marbling score, and fat thickness were measured.

Results

Statistical analysis of the data was performed by the Department of Animal Science. Average daily weight gains (empty body) shown in Table 1 was lower for the animals fed only 16 hours a day. Feed consumption data (Table 2) indicates that animals with food available for only 16 hours a day consumed less feed than the steers with feed available 24 hours a day. Quality grade, yield grade, rib-eye area, marbling score and fat thickness were all lower for steers fed only 16 hours.

Table 1. Associative effects of feed intake, average daily gain (empty body).

Group	N	Mean kg (lb)	Standard deviation
24 hr. feed	36	1.02 (2.25)	0.17
16 hr. feed	35	0.94 (2.08)	0.17

Table 2. Associative effects of feed intake, average feed consumption per day.

Group	N	Mean kg (lb)	Standard deviation
24 hr. feed	36	7.93 (17.5)	0.81
16 hr. feed	35	7.40 (16.3)	0.85

Conclusions

In general the 16 hour feeding period resulted in less feed consumption, slower weight gains and a reduction in carcass quality. Whatever savings that would be realized through reducing grain losses to birds may be offset by losses due to slower weight gains and reduced meat quality.

The possibility of a large commercial feedlot limiting the feeding time to 16 hours a day must be considered. In some California feedlots, feeding is conducted around the clock simply to feed all the livestock. Reducing the feeding period to only 16 hours would mean scaling down the number of animals they feed significantly. In our study the feed was removed by hand each morning; this would not be practical in commercial operations. We were unable to determine if it would be possible to regulate the feeding so that no feed would be available in the bunkers by morning.

Spillage caused by the feeding process and cattle feeding behavior along with feed storage on the site would perhaps be sufficient to attract a significant number of birds to the feedlot. Even if losses of non-waste feed could be reduced, the feedlot operators would still have to contend with possible disease transmission from the birds attracted to the feedlots by waste feed.

FEED COMPONENT SELECTION BY STARLINGS

Research has indicated that starlings selected the higher priced components of cattle feedlot rations. An experiment was designed to look at preferential feed selection by starlings.

Methods and Materials

Samples of the standard ration were collected. The milling company was contacted to determine the ratios in which the various components were mixed (Table 3). Measured amount (by weight) of the ration were presented to caged starlings.

Table 3. Percent by weight of components in a commercially prepared dairy feed ration.

<u>Component</u>	<u>Percent of Ration</u>
Pre-mix Dairy Pellets	39%
30.0% protein	
3.0% fat	
15.0% fiber	
13.6% ash	
2.0% calcium	
1.1% phosphorous	
35.3% NFE	
Grain Pellets	20%
10.0% protein	
3.4% fat	
15.4% fiber	
6.9% ash	
.16% calcium	
.45% phosphorous	
63.7% NFE	
Roller Corn	35%
Roller Barley	15%

Twenty starlings were divided among four cages. Water and an alternate food source was available ad libitum. Each day the remaining ration was removed and fresh ration put in its place. After one day of exposure the remaining ration was divided into the various components and weighted to determine the final ration. The feeding test was conducted for five days.

Results

Table 4 shows the percentage of each component consumed in relation to the amount of the ration consumed by the birds. In all cages the pre-mix dairy pellets and grain pellets were preferred by the starlings. Cracked corn was less attractive than the pellets but still preferred over the rolled oats.

Conclusions

Pre-mix dairy pellets (30% protein) and grain pellets (10% protein) made up 41% and 24% of the starlings selected diet, respectively. This is compared with the 30% for the pre-mix dairy pellet and 20% for the grain pellets in the diet as it was fed to the livestock. The percentage of cracked corn in the starling selected diet was 33% compared to 35% in the diet as fed. Finally, the rolled oats made up 2% of the diet selected by the starling compared to 15% in the prepared ration. Using the

Table 4. Percentage of each component consumed relative to the total amount ration consumed daily and for the entire test period.

Day	Component	Percent of Selected Diet
1	Pre-mix dairy pellets (PDP)	39
	Grain pellets (GP)	19
	Cracked corn (CC)	37
	Rollled Oats (RO)	5
2	PDP	42
	GP	23
	CC	33
	RO	2
3	PDP	40
	GP	24
	CC	36
	RO	0
4	PDP	44
	GP	26
	CC	30
	RO	0
5	PDP	40
	GP	26
	CC	32
	RO	2
Total for 5 Days	PDP	41
	GP	24
	CC	33
	RO	2

Chi/squared test for goodness of fit, there was a significant difference between the percentages of components in the ration as fed compared to the percentages of the components in the starling selected diet.

Given the preferential selection of the higher protein components by the starlings, treating feed ration with toxicants should be limited to the treating the components most preferred by the starling. Treating the most preferred components will 1) increase efficiency in transporting the toxicant to the target bird, 2) reduce time in prebaiting, 3) reduce cost of bait preparation, 4) and reduce chance of having treated bait made up of components not preferred by the starling remaining in the environment after control has been achieved.

A BIRD DAMAGE ASSESSMENT TECHNIQUE FOR TRELLISED GRAPES

Cooperating with the California Department of Food and Agriculture in Fresno, a technique for assessing bird damage to grapes was developed. A detailed report of this project has been submitted to ASTM for publication in the Second Symposium on Test Methods for Vertebrate Pest Control and Management Materials (Martin and Crabb, 1978).

METHIOCARB AS A POSSIBLE AVIAN REPELLENT FOR PROTECTION OF RIPENING FIGS

A study was conducted in the spring and summer of 1977 to test the possible avian repellency effect of methiocarb applied to Black Mission Figs in the Fresno area. In addition, damage assessments of all varieties of figs were conducted to estimate the industry wide loss to bird pests.

The University of California Davis conducted the research with assistance from the United States Fish and Wildlife Service, California Department of Food and Agriculture, Fresno, County Department of Agriculture, Fresno County Farm Advisors, California Fig Institute and several fig producers. The results indicate that methiocarb is not effective in reducing bird damage in figs. Details of the study and results will be published in the Research Proceedings of the 1978 California Fig Institute Research conference (Crabb, 1978).

FIELD TESTS TO DETERMINE EFFICACY OF AVITROL TREATED RAPE AND CANARY SEED IN HOUSE FINCH CONTROL

This study was conducted in cooperation with the California Department of Food and Agriculture and several County Departments of Agriculture. In this case the University's role was to assist in development of the experimental design to review and select test plots, and to assist in the initial cage trials to determine bait acceptance and effect of avitrol on house finch behavior. A detail report will be forthcoming.

CONTINUING STUDIES OF CAT

Studies relating to the use and effectiveness of CAT continue on the U.C. Davis campus. Those primarily involved are Drs. S.A. Peoples and Giri and a graduate student, C. Scott Nichols. To date these have been primarily laboratory studies with only limited field trials of chemical conducted. One line of research that is intriguing is the use of CAT and/or starlicide as a dermal toxicant to be used in perch systems such as Rid-A-Bird Perch. Portions of that research effort will be reported on Friday during the ASTM sessions (Nichols, *et al.*, 1978).

NEW DIRECTION FOR THE BIRD DAMAGE PROGRAM

At the present time, the University of California, Davis, is recruiting a Wildlife Specialist with expertise in pest bird management. The specialist's responsibility will be to develop and coordinate an applied research program dealing with pest bird problems, to communicate with other bird damage specialists throughout the United States to extend information developed at U.C. Davis or elsewhere and to act as a liaison between the University and the agricultural community. The specialist will play a key role in bird damage research in California over the next few years.

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